PROCEEDINGS OF THE SYMPOSIUM ON DRIP IRRIGATION IN HORTICULTURE WITH FOREIGN EXPERTS PARTICIPATING

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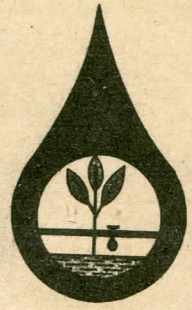

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ROW CROP WATER USE UNDER DRIP IRRIGATION

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In arid and semi-arid regions, planning for the efficient use of irrigation water is essential because of the scarcity of water, especially towards the end of the growing season. Having this in mind, a research program was initiated in 1977, and during 1978 and 1979, to study the effects of drip irrigation on three row crops, namely: corn, potatoes and sugarbeets. The objectives were: a/ to compare the consumptive use of these crops under drip irrigation with that under other irrigation methods, and b/ to study the effects of different water and nitrogen fertilizer levels and their interaction on the yield of these crops. In 1977, the corn crop was subjected to two water regimes: CW_1 irrigated to re-establish field capacity whenever there was a soil moisture deficit of 30 % by volume, and CW_2 receiving 20 % less water than CW_1. In 1978, sugarbeets were subjected to three water regimes: SW_3 irrigated to replenish field capacity whenever a soil moisture deficit of 20 % was reached, and SW_2 and SW_1 receiving 75 % and 50 % the amount of water received by SW_3, respectively; three nitrogen levels were considered. 100, 150 and 200 kg N/ha. In 1979, potatoes were subjected to two water regimes: PW_1 irrigated when soil moisture tension reached a value of 30 cb at 45 cm below ground level, and PW_2 irrigated at a soil moisture tension of 50 cb at the same depth; three nitrogen levels were considered: 150, 250 and 350 kg N/ha.

Corn dry matter yield was 13.08 and 11.74 tons/ha under CW_1 and CW_2 while grain yield was 26.00 and 24.25 t/ha respectively. For sugarbeets, there was a positive response to added water in root yield and sugar yield, e.g. when 200 kg N/ha were added, the root yield was 66.3, 88.2 and 102.2 ton/ha under SW_3, SW_2 and SW_1, respectively, and the sugar yield was 9.8, 14.0 and 15.1 tons/ha. The yield increase produced by fertilization followed a decreasing increment function: under SW_3, the root yield was 87.1, 97.1 and 100.2tons/ha when 100, 150 and 200 kg N/ha were added. Potato tuber yield ranged from 25.12 tons/ha under PW_1 and 150 kg N/ha, to 20.81 ton/ha for the same fertilizer level. Finally, there was a marked effect of water regime on the consumptive use of all crops: as the amount of irrigation water was decreased, daily and cumulative consumptive use decreased.

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